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ABSTRACT

This booklet contains six case studies describing creative and successful teachers who have demonstrated that teaching architecture and urban design from many perspectives makes a great deal of educational sense. The teachers represent a variety of disciplines and teach at various levels, but all recognize the positive possibilities inherent in the problem-solving aspects of architecture. They have used architecture for many reasons including: as a vehicle for interdisciplinary teaching, for exploring a specific subject, and for drawing school and community together in a joint concern for the environment. The approaches highlighted are: (1) an elementary, interdisciplinary curriculum based on urban studies, (2) a high schcol design course, (3) an upper elementary school waterfront project, (4) a building project by one special student, (5) a junior high school study of three-dimensional forms and structures, and (6) an architect-in-residence program. (Author/MK)

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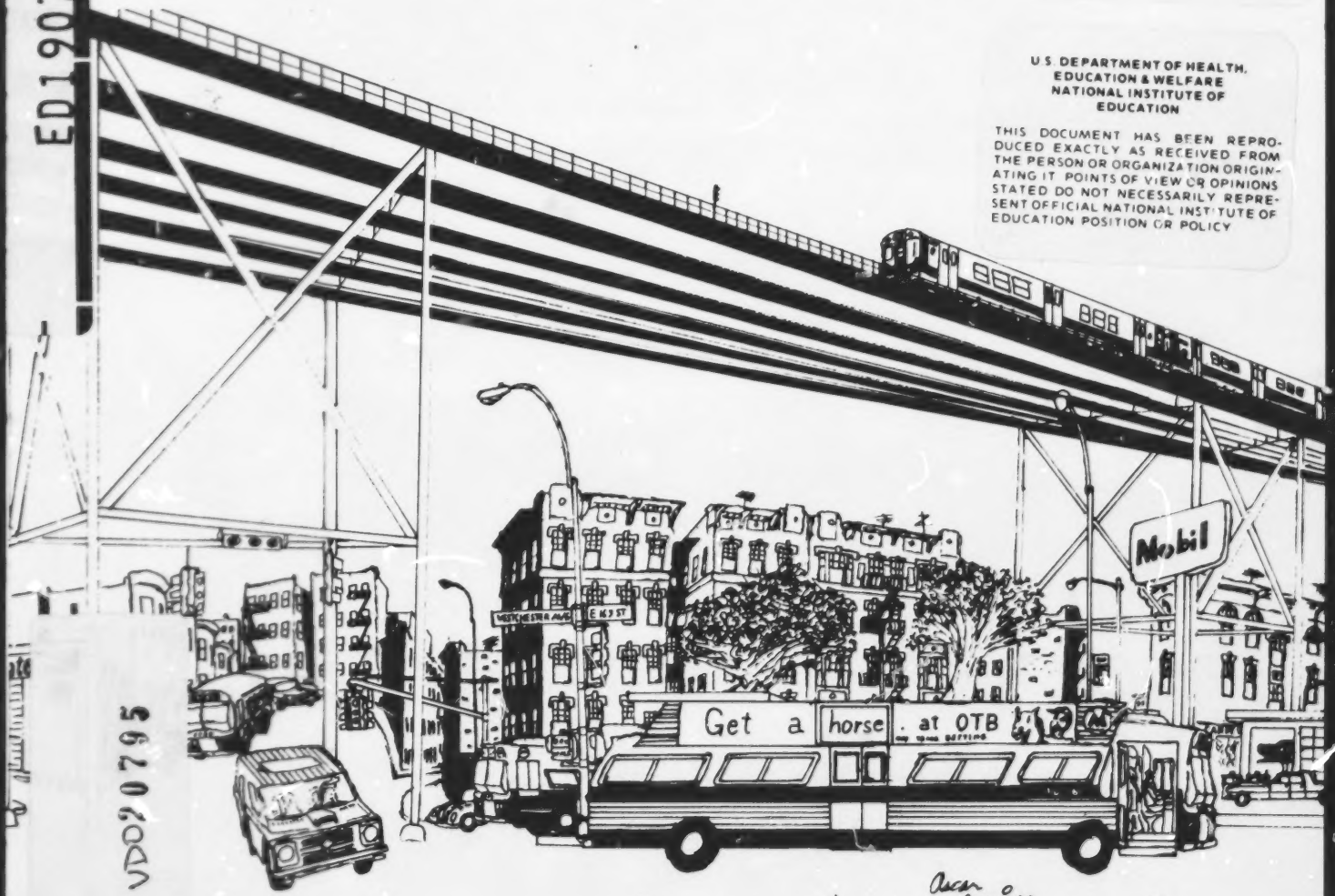

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foreword

The six case studies in this book are about different kinds of teachers, different schools, and widely divergent programs. The one thread in common is that they are all about teachers who have chosen to use the "built environment—that is, the architecture and the world around their students—as a focal point for interdisciplinary teaching.

All of these teachers and schools recognize that the whole child is being taught, learning not only from the printed page but, perhaps, even more from the physical world around him—the world of streets, buildings, parks, bridges, playgrounds, trees and plants. Among these case studies every teacher from kindergarten through high school can find more than a few ideas worth using. Certainly, students can only profit from any activity which leads to a greater understanding and sense of involvement with the physical world around them.

Charlotte Frank
Executive Director (Acting)
Division of Curriculum and Instruction

introduction

"One of the most valid reasons for teaching architecture is that it is based on problem-solving and if that problem-solving aspect of architecture can have personal relevance to the students—all the better.

Bryna Eill, Art Teacher
LaGuardia High School of Music and Art

Architecture has the beauty of many things. It is an art form, a science, a form of self-expression that can be political, cultural, historical, or environmental. Indeed, it is so multi-faceted that most imaginative teachers could find within architecture a suitable place in which to pursue their particular spheres of interest. The cultural anthropologist, for example, can discuss and compare types of shelters; the engineer can focus on bridges and tunnels; the historian can investigate patterns of local community development; the artist can design architectural embellishments; the mathematician can investigate structural parameters; the language arts teacher can explore a sea of urban literature. In fact, if a flowchart were designed with architecture at its center, there would be infinite paths to explore through a variety of disciplines.

This booklet identifies several creative and successful teachers who have demonstrated that teaching architecture and urban design from many perspectives makes a great deal of educational sense. Described in six case studies, the teachers represent a variety of disciplines and teach at various levels, but all have recognized the positive and endless possibilities inherent in the problem-solving aspects of architecture. Some have used architecture as a vehicle for interdisciplinary teaching; others for exploring a specific subject, others for drawing school and community together in a joint concern for built environment. Whatever the individual approach, at the base of each curriculum is a valid, exciting, and unifying concept.

The case studies reveal, too, that teaching architecture has another equally attractive advantage. It gives students a greater appreciation of their city, their home, and their environment. They learn to observe and question what is around them by using their community as a laboratory and to face the problems and challenges of urban living.

The review of these six successful programs is presented as a springboard, as a preliminary step, to help teachers who want to pursue projects in architecture either similar to one of these or of their own design. It is for this reason that the selections highlight a variety of approaches:

- an elementary, inter-disciplinary curriculum based on urban studies
- a high school design course
- an upper elementary school community water-front project
- a building project by one special student
- a junior high school study of three-dimensional forms and structures
- an architect-in-residence program

It is not the intent of this booklet to urge straight replication of any of these programs; a good program must reflect the individual needs and interests of students, teachers and communities. Rather, we hope that most readers will find inspiration from at least one program and interest in all of them.

acknowledgments

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Grateful appreciation is extended to the following individuals without whose assistance this booklet would not have been possible:

Gretchen Dykstra	special consultant and writer for the project
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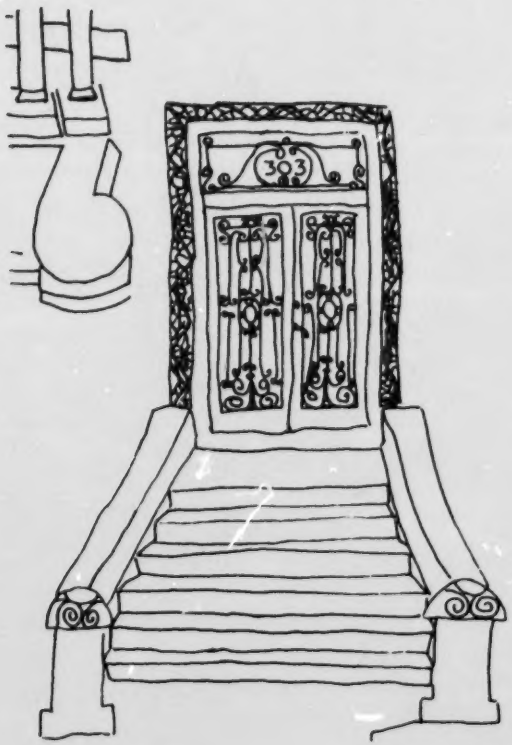
Conrad Nunnally	mechanical artist
Maureen Maguire	editor and graphic designer; researcher and writer on Architects-in-Schools program

Cover design by Conrad Nunnally as suggested by Rosemary Stroer using Oscar Ramirez' drawing.

Special thanks is due to the teachers and principals whose tireless efforts and creative inspiration are documented in this booklet.



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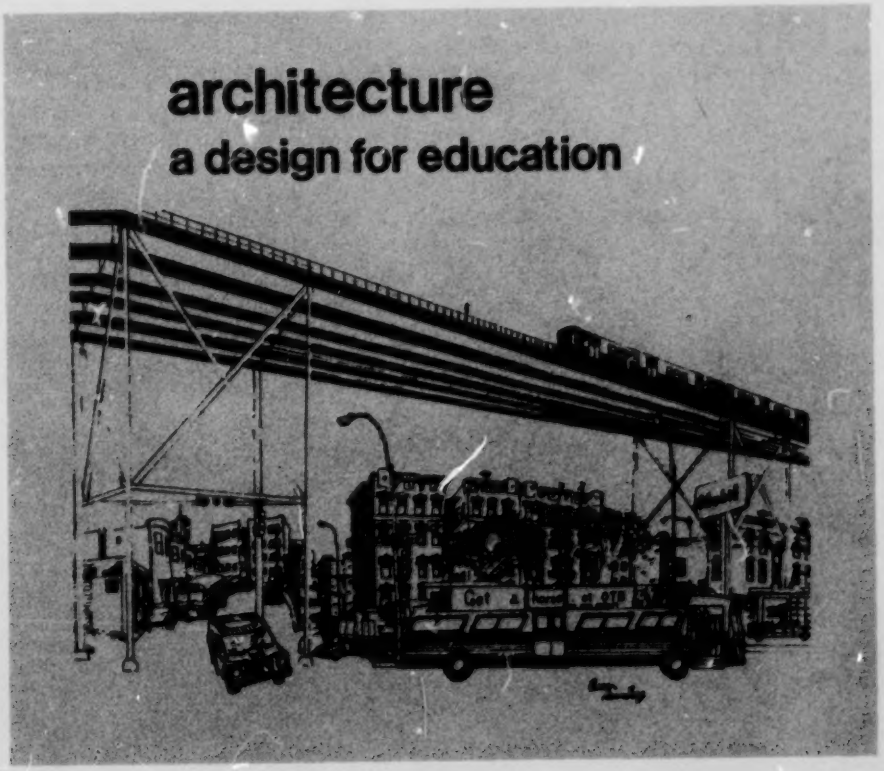
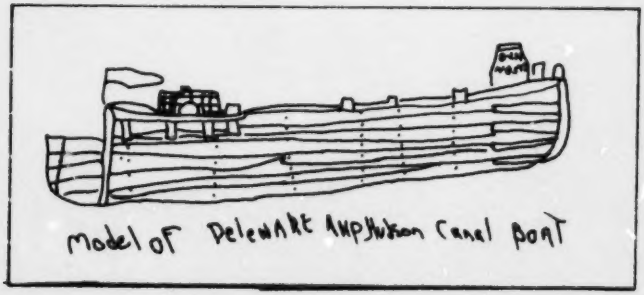
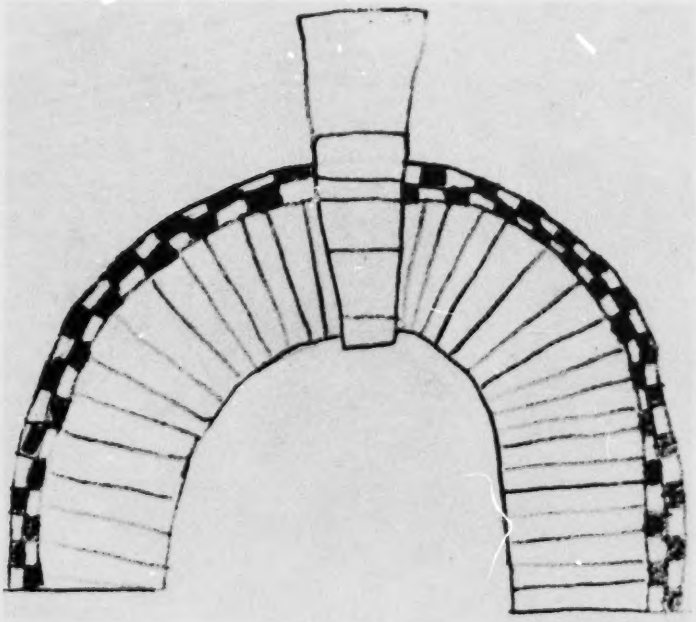


The Roosevelt family crest.



Model of Delaware Amphibian Canal Boat



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sccaadss—an acronym

Word has it in some circles that all the energetic and creative teachers disappeared during the budget cuts of '75. It just isn't so; and fine proof exists at P.S. 75 in Manhattan's upper west side, where three veteran teachers have banded together to develop an architectural curriculum that is ambitious, impressive, and successful. While they work under the sympathetic and supportive aegis of Principal Luis Mercado, credit for their program SCCAADSS falls squarely and justly in their laps. Investing their own time, energies and resources, these teachers have shown that a curriculum based on urban architecture works for third and sixth graders.

SCCAADSS is the dramatic and peppy acronym for *Society*, *Cities*, *Cultures*, *Art*, *Architecture*, *Designs*, *Science*, and *Structure*. It describes not only the academic scope of the program but also captures the spirit of a curriculum firmly grounded in traditional academic disciplines but approached through experiential channels.

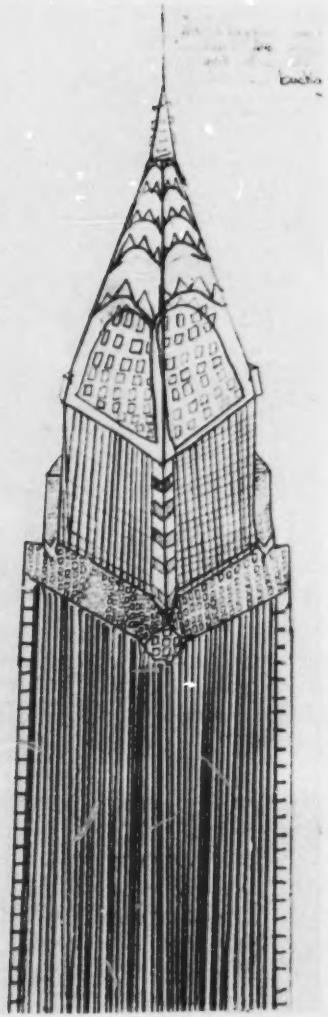
The germs of many new ideas is often simple and inauspicious, and so it was with SCCAADSS. Ruth Lowy-Lacey, a third grade classroom teacher with a background in art and design, took a course with Dr. Salvadori at Columbia University's School of Engineering. Dr. Salvadori is not new to New York's public schools. He has been an advisor in District 4 for several urban design programs and his architecture course for teachers comes highly recommended.

Ruth's excitement about the possibilities inherent in teaching architecture to youngsters proved contagious. Her colleagues, fifth-grade teachers Michael Temple and Esther Rosenfeld,caught the bug. Michael took Dr. Salvadori's class and Esther enrolled in an architectural history course. For the three teachers, these courses served as springboards for their own imaginations and provided a common base of knowledge.

Ruth, Michael, and Esther have known each other for many years and they share a mutual admiration and respect for one another's teaching styles. Because their interests vary, they have among them the seeds for building an ideal team: Ruth's background in art and design, Michael's expertise in math, science and engineering, and Esther's academic passion for the humanities.

"We began meeting during the summer of 1977, to brainstorm and plan our course of action," explains Esther. "We knew we wanted to find a way to use each other's strengths to complement our own. Our first decision was to give up one prep period per week. During that time the 'free' teacher would visit one of the other two classrooms to enrich the program with her or his expertise." Esther, for instance, would offer a poetry class or an architectural history class or a writing lesson.

"Within two months we decided to change our approach," continues Esther. "The program was proceeding so nicely and the kids were co cooperative, rather than swap prep periods, we would switch classes once a week. This allowed us to have the



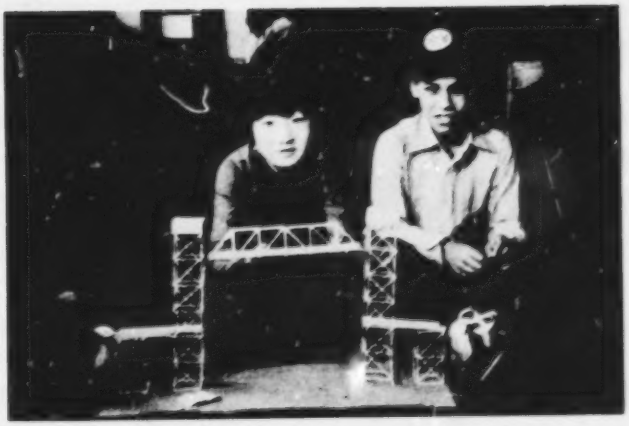
children for an hour and a half, or an extra forty-five minutes."

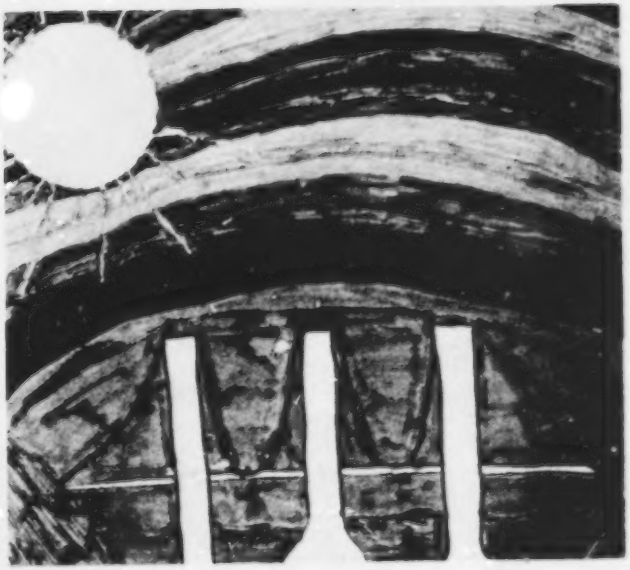
With time schedules working smoothly, they now had to find a focus. There are endless avenues available for exploration and an attempt to travel all routes would have proven disastrous. "We realized that we had to narrow our focus," said Esther, "But we didn't necessarily know how to do that. We knew that our first year would be a time for experiments with failures as well as successes."

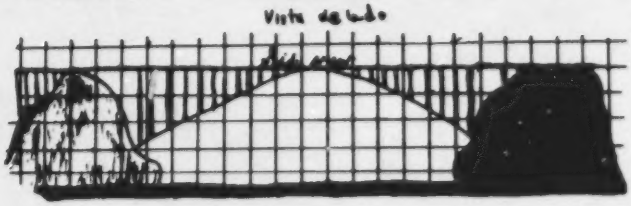
In the early months, the three classes were producing a variety of projects, reflecting not only the interest of its individual teacher but also the expertise of the other two teachers.

Soon to emerge was SCCAADS, the core curriculum for all three groups with an interdisciplinary approach to all skills, highlighted by one or two particularly strong projects in each class.

SCCAADS was properly launched with the three teachers agreeing to a joint activity to include all their students. A Circle Line boat tour would prove to be a rich and fun experience tied directly to their curriculum. In preparation for the trip, the teachers shared in the detailed planning to emphasize certain academic assignments for which the students would be responsible. They developed a trip sheet or student guide to help the student focus on three areas: bridge designs, sketching architectural features, and mapping routes. Michael gave each class a few introductory lessons on basic principles of engineering, *i.e.*, the differences between arch, truss and suspension bridges. Ruth taught each class how to do quick sketches, a







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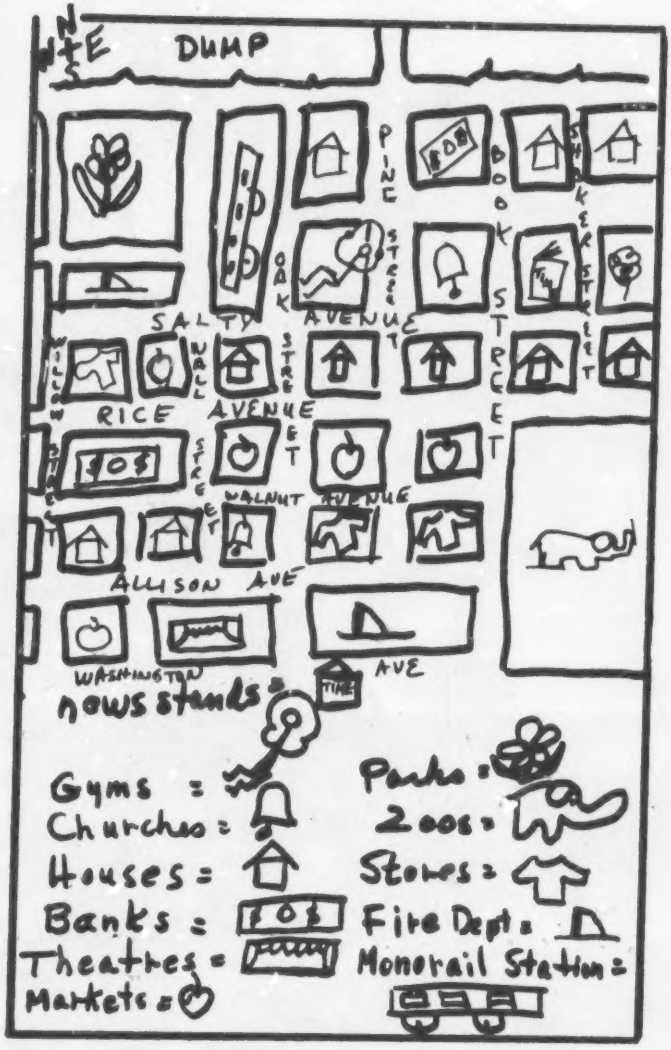


skill students would use extensively on their trip to draw different types of bridges and buildings. Esther, meanwhile, introduced all classes to maps and the route that the boat would take.

On the day before the trip, the teachers met with all three classes to review the trip sheet, to give final instructions and to foster an academic stance *vis-a-vis* the upcoming outing. They invited parent chaperones to attend this briefing in the hopes of arousing their enthusiasm.

The trip was a great success. In its aftermath the students' work was reviewed and discussed and the three teachers met again to plan appropriate follow-up activities. Immediate assignments included writing reports, refining sketches, organizing a slide show with appropriate narration, mapping with an emphasis on the landmarks seen from the boat, and model-building and mural painting.

This auspicious beginning gave rise to many projects. Michael, for instance, concentrated on structures and principles of engineering. Using erector sets, constructo-straws and found objects, his class began to experiment with tensions, compressions, and basic building skills.

His class also met with a representative from Community Planning Board 7 to learn about that elected body of officials. They discussed with the representative the neighborhood adjacent to the school which they had carefully explored and mapped. The class then elected its own five-member planning board which in turn drew up a building code.

This same group planned several square blocks of an imaginary city following many of the guidelines they learned from reading and studying David Macauley's *The City* and discussing with Esther the characteristics and needs of most cities. Each student then wrote a description (including scale measurements) of the building he or she wanted to build and submitted the plan to the class's planning board. There it would be approved or modified according to the guidelines and the student would be granted permission to proceed with "construction." The model city was well on its way to completion in late June.

Ruth was interested in having her students become aware of architectural detail, texture, and embellishment. Refining their quick sketches of architectural features observed on their trip, they designed large murals of the skyline.

Her students explored texture by making animals and figures of different materials. The younger ones worked with textures by first discussing and describing them. They then went into architectural texture, learning about different materials, light and dark, and composition. The older students began a study of entrances and window frames in their neighborhood. Using their skills to do quick sketches they returned with particularly interesting architectural detail. These sketches were later polished and refined and added to the class scrap books which recorded the work of SCCAADS.

Esther concentrated on map making and the humanities. She wanted her students to learn the skills

implicit in cartography by making their own maps. They worked on maps of New York, maps of their neighborhood, maps of the school, topographical maps and cross-sectional maps. Her class also produced a large-scale mural of the skyline incorporating some of the more famous buildings which they had visited and studied. These buildings—including the Guggenheim, Cooper-Hewitt, Empire State, Woolworth, and United Nations—provided the base of her social studies and language arts program. Her students also interviewed architects and construction workers, read the history of the buildings and biographies of the architects, and researched and wrote reports about the buildings. They read from an extensive file of newspaper and magazine clippings about urban design and renovation. Esther organized this file for reading comprehension lessons. They also read and memorized urban poetry and studied the art of urban artists.

In the past year, each teacher planned to expand those areas which he or she felt most comfortable and excited about: Esther, her mapping program; Michael, his engineering and construction component; and Ruth, her architectural detail emphasis. But it's for another more important reason that SCCAADS will continue to expand and grow. This is how Esther poignantly described it during a recent class trip to the South Street Seaport Museum in lower Manhattan: "In preparing for our trip I had brought in photographs of Greek Revival and Federal buildings and mansard roofs. We studied the pictures, learned the terms and briefly reviewed the history. When we were walking down Fulton Street the kids began to call out, 'Look at the Doric, look at the Ionic. There's a Greek Revival. Look at the temple top!' It was very exciting! They had learned those terms and they were beginning to look at their city with a new eye, that fresh and observant eye I had wanted to develop."

wateredges: a process in urban design

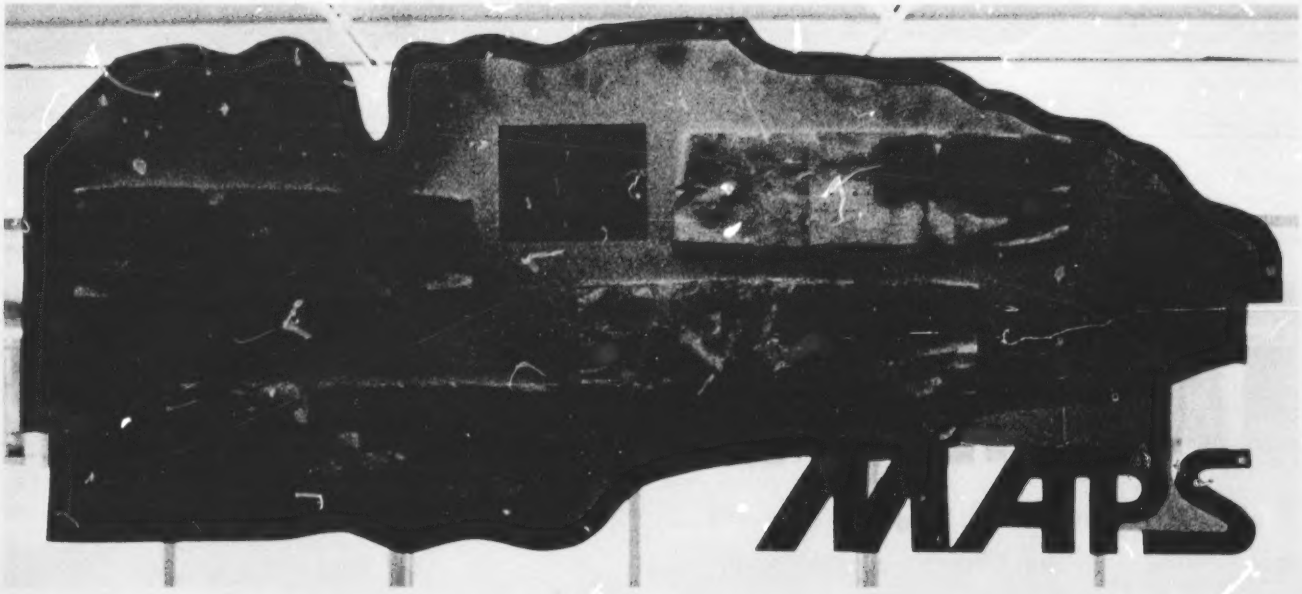
Roberto Clemente State Park stretches along the Harlem River right under the relatively new and very handsome Harlem River Park Towers, a middle-income housing complex. On half of its 26 acres there is a sleek swimmming pool area; the other half is totally undeveloped and unused but potentially beautiful.

In 1973-74 a non-profit research group called "Wateredges" received a grant from the National Endowment for the Arts to investigate and evaluate the 578 miles of New York City waterfront and then choose 35 sites suitable for reclamation and development for recreational, cultural and environmental use. Roberto Clemente State Park was one of the sites selected. Its location along the river, its proximity to a housing complex and two schools, and its present state made it a natural not only for development, but also for citizen and student participation in its planning.

Wateredges, under the leadership of Richard Dempsey, an architect, joined Community Environments, a non-profit arts and environmental organization, to design a variety of environmental education programs for students and adults to stimulate community awareness of their waterfronts and initiate preliminary planning for their use and maintenance. The first program, a series of workshops, was conducted on Roosevelt Island in 1976-1977 among school children, senior citizens and patients from Goldwater Hospital. A year later, a second educational program was introduced, in Community School District 9, the Bronx, and involved students from Community Elementary School and Community Intermediate School 229 (the two schools which abut the Harlem River Park Towers and Roberto Clemente State Park) and local residents.

Two classes (Annette Jackson's fourth grade class and Pat Frazier's fifth grade class) were chosen to participate with Stanley Mandel, the CIS 229 science teacher, acting as in-school coordinator. Barry Cohen of Community Environments arranged for weekly workshops under the direction of Carol Sterling, an experienced and creative environmental-arts teacher. In addition, the residents of the Towers were contacted and interested people registered for after-school workshops also taught by Ms. Sterling.

The goals of the program were clearly defined. They would study the park land and, in particular, the wateredge. They would become aware of the environmental hazards of the polluted Harlem River; they



would use questionnaires to solicit suggestions for the park's development from other residents; they would design and construct maps of the area including those recreational and cultural facilities the participants would enjoy; and they would organize a year-end exhibit for the greater community to demonstrate their work and plans.

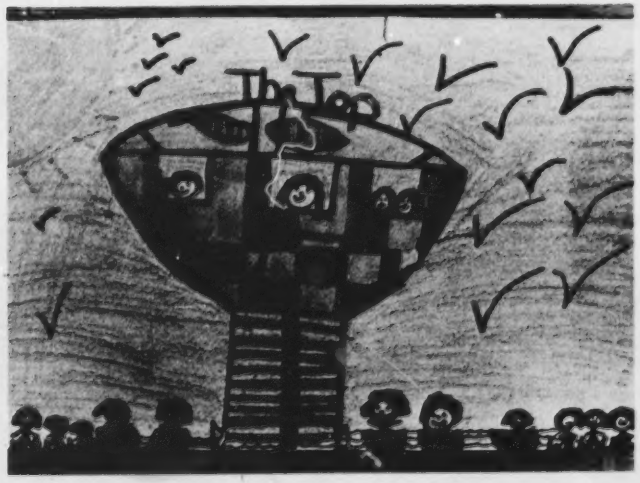
"The first step in rebuilding one's community is to nurture a sense of belonging in that community," says Stanley Mandel. "It is this process which provided the educational and artistic backbone of the project."

The program was limited to one class per week, an hour and a quarter long, with Carol Sterling presiding. Although the problem-solving aspects of the program make it rich in interdisciplinary possibilities, the teachers had already committed themselves to a full and demanding curriculum. Nonetheless, because of the inspiring efforts of Carol Sterling and Stanley Mandel, extensive and creative work was completed in the regular classrooms during that year.

The classes used the science laboratory which is a large and workable space. They were introduced to the project with a slide show and discussion about waterfronts—their history, use and aesthetics. The students, having been exposed to comparative uses of

waterfronts, began lively discussions centered around the myriad possibilities that Roberto Clemente State Park offered.

In succeeding sessions, the classes actually explored the empty site. The students collected natural and "man-made" samples and returned to the science lab with their collection where they analyzed rock and water samples. Some students painted pictures of the site; some organized mini-natural-history exhibits. Other designed and constructed three-dimensional collages representing their perceptions of the site. Stanley Mandel offered appropriate scientific information for these activities which were reinforced and supplemented by traditional resource materials: books, slides, photographs, and maps of other waterfronts. The students were really beginning to understand the possibilities for their park.



"The world of these children will be a world of limitations unless they are made aware of the potential around them," says Carol Sterling in describing the project's early stages. Their park is not just an empty lot destined for continual abuse and misuse. It can be a place of real importance in their lives and a place in which they can feel proud. The children began to care about it."

The students' journals, a mandatory part of the program, reflected this growth and were quickly filled with comments and descriptions of their weekly activities. "I think it is a dumb idea to study an ugly empty lot," one student wrote early in the project. This same child later wrote, "I see that this dump is not a dump, but that it could be a pretty park and I could use it. That would be great."

After making evaluations and observations of the site, the students began mapping exercises of the area. They made measurements and determined scales. They drew individual maps. On these small maps the students began to plan the site according to their wishes. Later each class constructed large plastic maps (four by six feet) incorporating in their design the composite class view of the park.

Community involvement was important in such projects and students working together wrote a questionnaire that solicited local residents' views about the park. The students were then responsible for conducting the survey. This enabled them to make contact with the people in the Towers, share with them some of their newly acquired knowledge, and excite other residents about the park.

The questionnaire was very complete. There were several questions which the students had developed from their study and research about other parks. "What facilities would you like to see in the park? Rate them on a scale from 1—5." They offered a list of 40 different facilities including: cultural center, soccer fields, library, bandshell, snack bar, amusement park, flower garden, etc.

Having discussed the potential use of the waterfront, the students included on the questionnaire possible facilities for that site. Some of their ideas were a museum of old shipping paraphenalia, docking area for sightseeing boats, a floating theater, or a floating health center. Again, these ideas were gleaned from their study of the many uses of wateredges.

They also asked the more difficult questions: Why isn't the park being used more? Which problems (poor facilities, crime, transportation, etc.) are most significant in keeping people away?

After the survey was conducted and the results were compiled by the students, the outcome was considered in the actual planning of the park and the subsequent design of the large wall map. After determining the most popular and desired facilities, the students discussed where and how these were to be placed in the park. They realized that most elderly people voted for gardens and benches while the younger people opted for music, dance halls and amusement parks. To satisfy both constituencies, the students decided it would be best to separate the park into interest areas and thereby keep noisy activities away from quiet areas. They also reasoned that the elderly would have a harder time walking the full length of the park, so facilities particularly appropriate for them were placed closest to the residential Towers.

Slowly the map design began to take shape. Relative sizes were discussed and compromises made. As plans evolved in the two classrooms and in workshops attended by community residents, each group had an opportunity to review the others' work.

Different priorities (demands and wishes) were being observed and dutifully recorded. "The afternoon old people," wrote one student, "have many more boring activities in their park. But we have many more loud things."

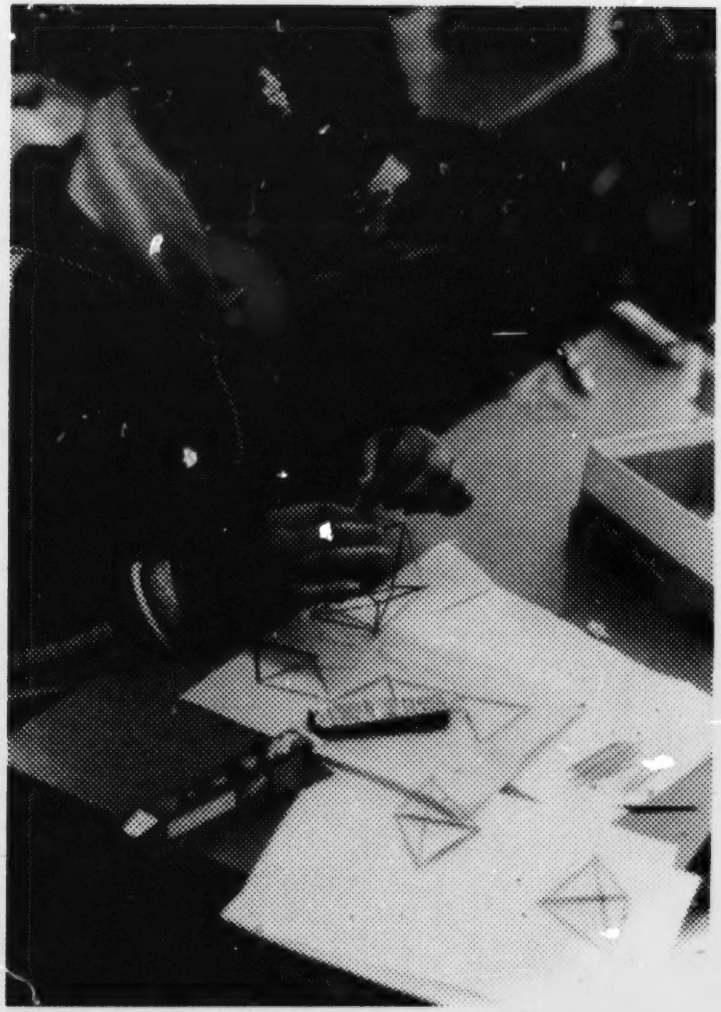
These planning sessions also included art lessons

where the participants designed and drew their own imaginative solutions to some of the desired facilities. One elderly resident built a colorful and detailed model of a riverboat. A youngster drew a fish ferris wheel which he foresaw in the amusement park. "All these activities within a creative and artistic context helped the students realize that the park would be theirs and could and should represent local wishes and sensible planning. That is an important first step in community awareness and hopefully, political action," explained Richard Dempsey.

The students did, indeed, have a chance to meet the Park Director, Richard Ortiz, as well as hear from the State Park Official responsible for Roberto Clemente State Park's eventual development. Letters were written and interested individuals were invited to the end-of-the-year exhibit. Through these activities the students began to learn about political structure so that their local representatives became more familiar and took on greater importance. While these attempts at political action were minimal, they did begin to develop for the students the link between community action and political action.

The end-of-the-year exhibit was a great success. Hundreds of people came to look at the artwork, study the maps, discuss the results of the survey and eat food donated by local residents. The event took on the flavor of a block party within a school with a specific, exciting and local focus.

There are 35 sites around the city that have been earmarked as suitable for similar programs. They include Fulton Landing and Sheepshead Bay in Brooklyn, Terminal Market and City Island in the Bronx, Sherman Creek and Morton Street Pier in Manhattan, Pot Cove and Beach Channel in Queens and the Narrows in Staten Island. The school-based project just described has proved that participating in the planning and developing of waterfront sites is an educational venture worth the investment of time, energy and imagination.



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project synergy

The world of classroom teaching often breeds hero-teachers for children; one of the more spectacular of this breed is Gerry Segal. He is known in a variety of professional communities, educational and cultural, by many different people—all of whom respect his intelligence, envy his energy, and appreciate his warmth and humor. He is a teacher-turned-administrator-returned-teacher who has built a whole curriculum around the theories of Buckminster Fuller. Gerry teaches at Robert Wagner Junior High School 167 in Manhattan where he has developed Project Synergy, a mathematical curriculum based on Buckminister Fuller's theories of synergy.

For many of us synergetic theories may appear to be too esoteric, too specialized for replication. But this is simply not true. Interested, energetic, and curious teachers can try similar projects with equal success.

Gerry taught for many years in public schools around the city before becoming head of a mathematics lab in the Benjamin Franklin Street Academy. From there he went on to become director of the Clinton Program, an alternative middle school using the resources of the city. In was at Clinton while teaching Jerome Bruner's *Man: A Course of Study* that Gerry asked himself how a math curriculum could have the same relevance and importance to a student as the discoveries and realizations made possible in that social studies curriculum.

"The kids were learning social studies in an interdisciplinary fashion and were reaching important concepts through their own study. My algebra class didn't have the same relevance. So I asked what could relate to life, could be interdisciplinary, and might lead to worthwhile ethical questions? What seemed logical was the study of three-dimensional structure," explained Gerry.

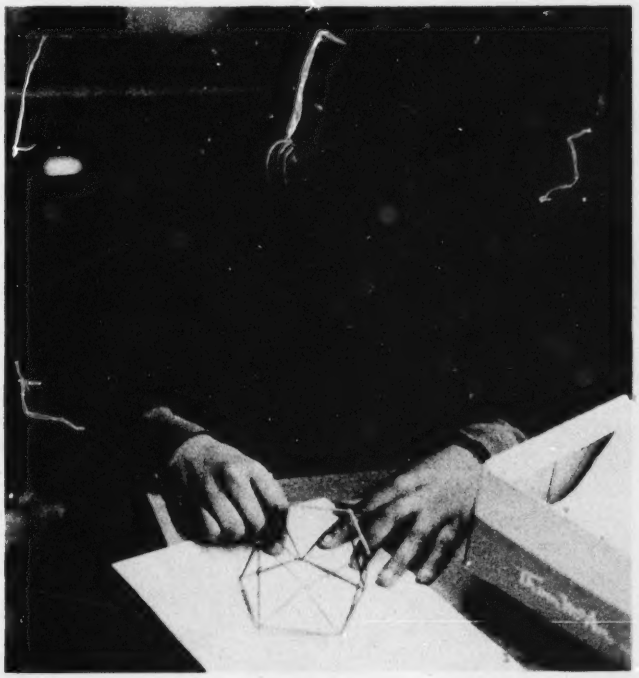
This might not have come easily to many people, but Gerry went on to explain that the history of cultures can often be viewed from the kind of structures they needed and developed. Since the triangle appears repeatedly in different aspects of culture and nature—whether it be the tepees of hunters, the mosaics of Islamic Art, or the structure of the atom—the work of Buckminster Fuller seemed well suited for this kind of approach because his whole geometry is three-dimensional. Rather than starting with a point which doesn't exist or with a line that by definition doesn't exist in the three-dimensional world, Gerry starts the class with a vector edge—a toothpick or a ruler or any tangible line. Unlike a concep-

tual line which has infinite length and no width, a vector is a finite line with width and depth, that is, it does exist in a three-dimensional world, our world. Therefore, it is much easier for most people to grasp, understand and eventually use a vector.

Project Synergy began when Gerry left the Clinton program and returned to teaching at Junior High School 167. Although he recognized the project's interdisciplinary possibilities Gerry decided to proceed slowly and carefully. A class of 35 average seventh graders whom he taught in a regular daily math class met twice a week, and Gerry used the three other regular periods to underscore theory or practice fundamentals.

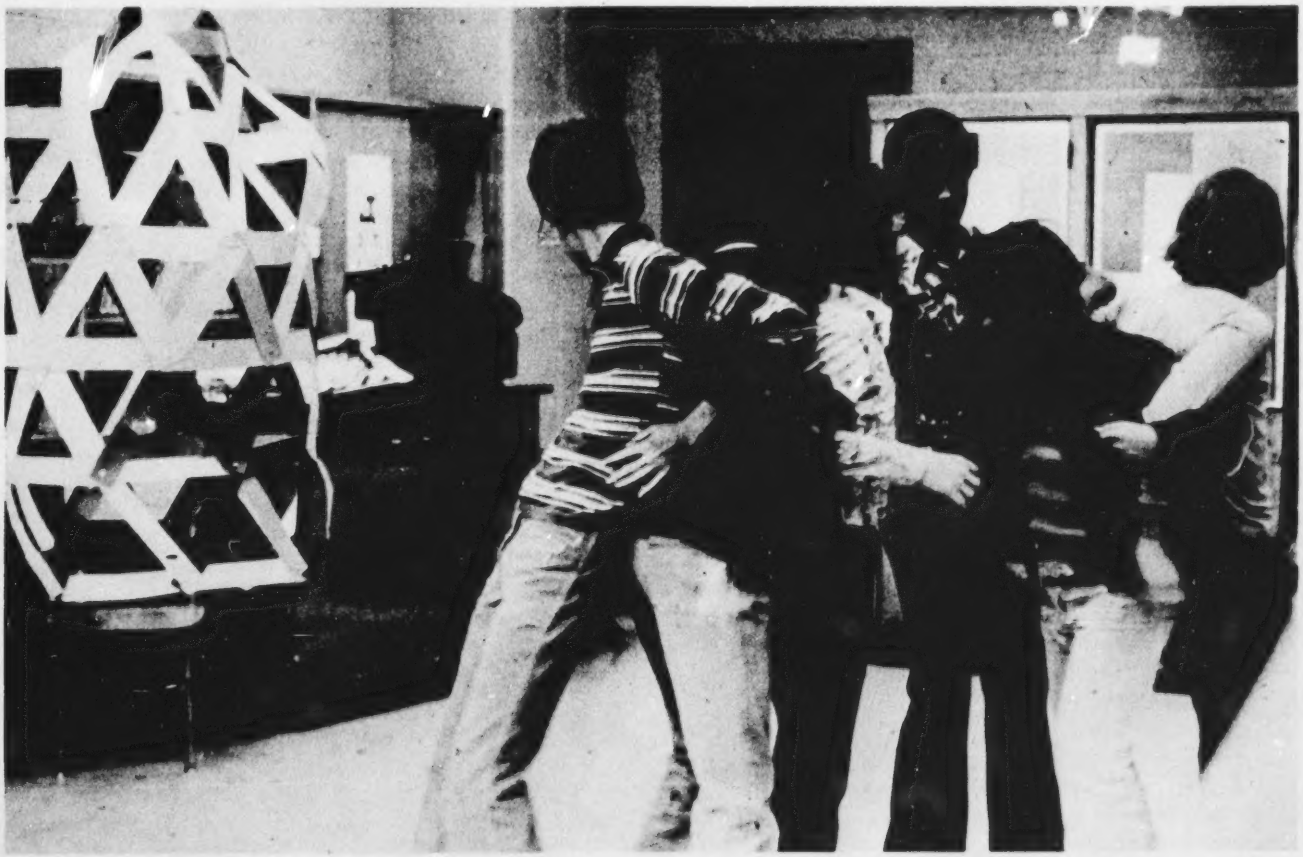
Now that Dennis Franco, the science teacher, has joined the project, the same students can also have synergistic concepts in science. They can investigate the basic Platonic shapes under microscopes and build models of chemicals and viruses having the same forms.

After the students are introduced to vectors, they discover through their own manipulation of simple building materials that the first and only rigid polygon is a triangle. "The kids make necklaces out of cardboard and paperclips. Through a process of elimination and deductive reasoning, they discover that no shape is rigid



except the triangle. They rediscover old and basic concepts of mathematics. After their discovery we then talk about some of the history and theory of that discovery. However, by this time they already know it on their own," explains Gerry.

Once the students have become very familiar with the qualities of a triangle, they are introduced to the tetrahedron and then are slowly and methodically introduced to the other four Platonic shapes (octahedron, icosahedron, cube and dodecahedron). One by one, they



learn about them, build them and play with the shapes. Gerry feels that it is important to have young adolescents work together at concrete tasks; so most of the building is done in small groups. Their work with the shapes is simultaneously covered in Dennis Franco's science class. Moreover, this past year Project Synergy for a while had a dancer-in-residence who worked with the students on movements based on these forms. Gerry also established a working relationship with the Metropolitan Museum of Art whereby the students would be introduced to Islamic art which is based on the triangle and tetrahedron. All the beginnings of a fine interdisciplinary curriculum fell together.

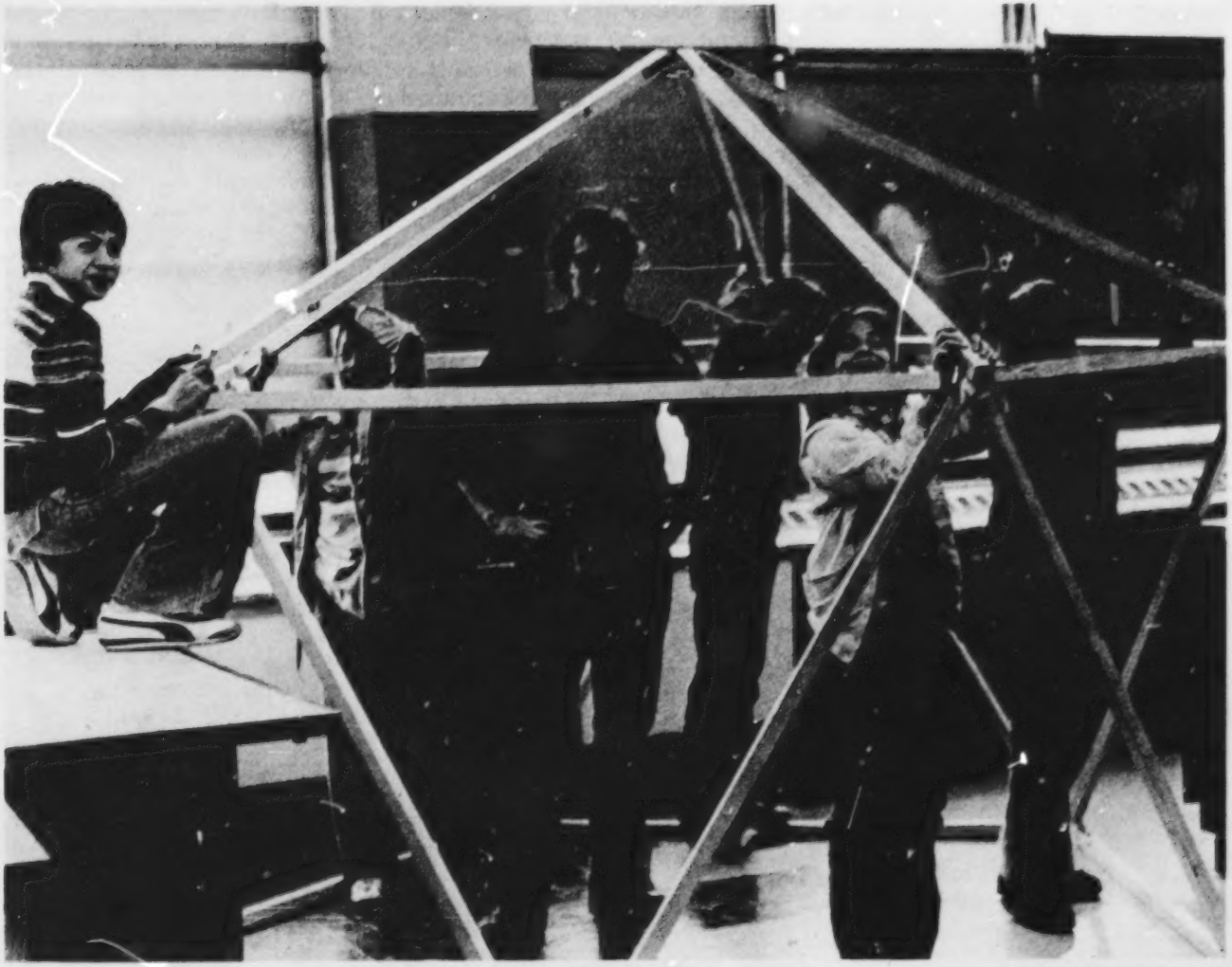
Gerry was interested in having the students actually apply their new knowledge. Having been introduced to Buckminster Fuller's work, the students knew that the geodesic domes which he popularized are based on the icosahedron (twenty triangulated sides). It was only a short time before a decision about a project was reached. With Gerry's approval and encouragement, the students decided to use their building know-how to build a functional greenhouse.

The structure was designed to be about 8 feet tall and 12 feet wide and took about two months to construct. Two-by-fours were bought for the frame, and polyurethene was purchased for the walls. (The total cost was $35.) The students were placed in groups and the groups rotated to work on the dome under the supervision of Gerry or Dennis.

The greenhouse was built in a classroom (permission was not granted for rooftop placement) and it became an effective hothouse. The students learned through direct observation that airtight spaces produce greater heat, seeds germinate quickly and plants flourish. Although they enjoyed growing plants, the most rewarding outcome was the cultivation and eventual harvesting (and eating) of asparagus, a vegetable made up of icosahedronal cells, a fine illustration of the interrelationship among natural structures.

Gerry is very modest about the results of Project Synergy. The school does know that his class averaged 2 to 4 years ahead of the control group when given the Stanford Achievement Tests at the end of the school year. Gerry will not say that that was a direct result of the project, but certainly the students' enthusiasm for math and their confidence in it increased appreciably. The students were expected to keep journals, logging their experiments, their discoveries, and their feelings about the program. Gerry noticed a definite change in the students' perceptions of their own efficiency and competence. The girls, especially, exhibited and expressed a greater awareness of new career opportunities. "Building the geodesic dome is like being a surgeon, putting something together and then watching things grow in it," wrote one student. Another student, a girl, observed, "I have never thought about building things. I never thought I would like it or be good at it, and I discover I am both."

Other students in the school are asking for the program, so next year another class has been added. Project Synergy also sponsors an after-school kite-making workshop where three-dimensional shapes are used to build kites and two-dimensional shapes are incorporated for the kite's design. Art teacher Miki Rosen has asked to participate and so the Project Synergy classes



will also have their art classes related. Thus Project Synergy has taken another step toward total interdisciplinary teaching.

Gerry admits that his background in and passion for mathematics has helped immeasureably in the development of Project Synergy. However, its potential use in a variety of disciplines makes it useful and applicable to other teachers. Dennis and Gerry have written the Project Synergy curriculum which takes a teacher through the process of building the Platonic shapes step-by-step.The curriculum is interdisciplinary, integrating elements of geometry, biological and physical sciences, visual arts, body movement and dance. It is available from the Division of Curriculum and Instruction, 131 Livingston Street, at a price of $1.50.

the psychology of space

"I love returning home after work. I have an apartment which affords me space, comfort and peace. I feel totally relaxed because I have enough space for all my various personal needs." Bryna Eill, an art teacher at the LaGuardia High School of Music and Art, understands the importance of space for people and cherishes her own personal space. She has, obviously, analyzed her own spatial requirements, her reactions to their denial, and the needs of other people for the same.

Spatial psychology, a subject on which Bryna has read assiduously, is the study of how space or the lack of it affects people. "Much of spatial psychology," explains Bryna, "is common sense and holds out no great surprises. We know, for instance, from scientific experiments that crowding can cause discomfort, anger and perhaps even violence. But, unfortunately, the theories are rarely put to practical use when environments are being designed. When housing projects are built, economic considerations rather than personal needs are operative; so the buildings tend to be large and impersonal, soon to be overcrowded. I don't believe," Bryna continues, "that architecture will improve until people see better and understand more fully the impact buildings can have on us."

In order to help her students "see better" Bryna has ingeniously combined her interest in spatial psychology with her enthusiasm for architecture. The doctorate which she recently received is partially based on her development of a curriculum on teaching architecture through spatial awareness. "I believe architecture is a permanent statement of body language. Rarely do we look at buildings as a reflection of the architect's spatial priorities or, subsequently, how that space truly affects the users of the space."

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Architecture is officially included in the New York State curriculum but it is rarely taught.* "And when it is taught," explains Bryna, "it is approached very traditionally. The nature of line and basic principles of structural engineering are presented. But with my junior and senior high school art students, I start with the psychology of space in the hopes of increasing their own awareness of spatial needs."

Bryna achieves this by presenting a series of proxemic exercises which she has developed. Proxemics is the term used for the actual relationships between people and their space; Bryna's proxemic exercises are lessons which help people understand their own spatial needs. "Everyone has experienced what I like to call spatial invasions, but many people have never thought how these simple intrusions affect them physically and emotionally—and how they can be avoided."

The first proxemic exercise is simple. The students are read a "Dear Abby" letter from a girl who calls herself "Lost Chord." Her complaint is that she loves to play the piano but she cannot bear it when someone sits on the bench beside her. The students are asked to write the reasons they think "Lost Chord" is disturbed; whether or not they have been so affected; and how they would respond to the girl. As they write their responses Bryna nonchalantly walks from desk to desk, purposely crowding individual students. She makes a mental note of how some students react to her "invasion." They later discuss "Lost Chord's" claustrophobia as well as their own unconscious reactions to Bryna.

Soon, thereafter, the students are introduced to John Calhoun's famous experiment in population density and social pathology. Using a control community of 56 rats, Dr. Calhoun added an extra rat and then observed atypical and asocial behavior among them. His experiment demonstrates that the introduction of new creatures into a perfect population balance can cause dysfunction. (A reprint of an article detailing this experi-

*Art Appreciation for the Elementary School, The University of the State of New York, The State Education Department, Bureau of Elementary Curriculum Development, Albany, 1968, pp. 21-22.

ment is available from *Scientific American*, see Bibliography.) Bryna suggests that the teacher rewrite this experiment and use it as a lesson in reading comprehension thus helping students to understand the general applications of this experiment on "behavioral sink."

After the discussion of behavioral sink among rats, it is important for the teacher to assist students in making specific connections with people, being careful not to encourage simplistic comparisons. Ask the students for example, how crowding affects them at home. What happens when extra people are invited for dinner? Where is it easiest to do homework? Through such inquiries, students begin to appreciate their spatial needs and to notice the demands of others for room. They will also begin to observe varying degrees of intensity among people.

For background reading suitable for teachers and students, Bryna suggests *The Hidden Dimension* by Edwin Hall (Doubleday, 1966) and *Presentation of Self in Everyday Life* by Erving Goffman (Doubleday, 1959). Both books recommend activities and examples useful for class investigation.

Students gain further insights by using examples from architectural history that demonstrate how architecture can manipulate people. Frank Lloyd Wright, for example, often designed small bedrooms as a way to force people into the larger, more social spaces of a house. Bernini purposely planned St. Peter's colonnade as a dark passage so that visitors to the Cathedral would have a heightened appreciation of the splendid interiors.

To give the students more personal experience in understanding architectural manipulation, Bryna recommends dividing a class into small groups and asking each to design a classroom maze. The task is to direct other students around the room, using color, light and forms as clues. (For instance, J.F. Kennedy Airport is all color coded to facilitate navigation of that immense place.) Other tasks for specific purposes can be assigned. Students might design a classroom for individualized learning, a classroom for lectures, a room for racial integration, etc.

Bryna also considers it essential that her students are taught the technical skills that include drafting floor plans, making axonometric projections, preparing cross-sectional drawings and building scale models. Although all her students are art majors, and come to her daily for two periods for a semester, there is a lot to

cover because few have studied these technical skills. Bryna, therefore, teaches these skills simultaneously with the proxemic exercises. Her students are also expected to read and report on several spatial psychology books.

"One of the most valid reasons for teaching architecture," Bryna explains, "is that it is based on problem solving. If this aspect of architecture can have personal relevance to the students, all the better." Their final task, therefore, is to design a personal architectural studio of 200 square feet. Their studios must include spaces for drafting, model-making, research/library, relaxation, storage, and photography. Students must submit a scale model, a floor plan, elevation and axonometric projections. It is a challenging assignment which combines their explorations of spatial psychology and technical skill.

The success of this course becomes apparent if measured by some very interesting tangential results. Although Bryna did not set out to instill architectural ambitions in her students, nearly one-third of them now want to become architects. Then, too, students already accepted into college architecture programs for next year have won almost $40,000 worth of scholarships. "I have never taken a course where I learned so much so quickly," one female student said. "I'd love to go on and become an architect but I don't think I am good enough. But now I notice things around the city, buildings that I never thought much about, and I'll never lose that whether I am an architect or not."

Bryna admits that the technical aspects of her course need to be taught by someone proficient in architectural drawing and drafting. While the psychological base of the course is adaptable to many disciplines, Bryna is presently unable to make administrative hook-ups. The natural tie-in would be with social studies teachers, especially urban studies, where spatial psychology plays a role that is political, social and cultural. (See *Defensible Space* by Oscar Newman.) There are also potential follow-up courses in architecture, interior design and architectural history. Bryna sees all the possibilities and believes that such an approach lends itself well to interdisciplinary connections which could further enrich an already fine program.

the transition of oscar ramirez

The programs described so far in this booklet have been exclusively academic projects conducted within a school. This particular study is a little different but well worth inclusion for what it can tell us about the powerful impact a community can have on its children and the wonderful effects a teacher can have if he or she allows a child, any child, to explore that real world, the child's world.

When first we met Oscar, he was fourteen years old and looking forward with some trepidation to his first year at the High School of Art and Design. His portfolio for entrance included detailed drawings of his neighborhood in the South Bronx as well as cardboard models of many buildings in that community.

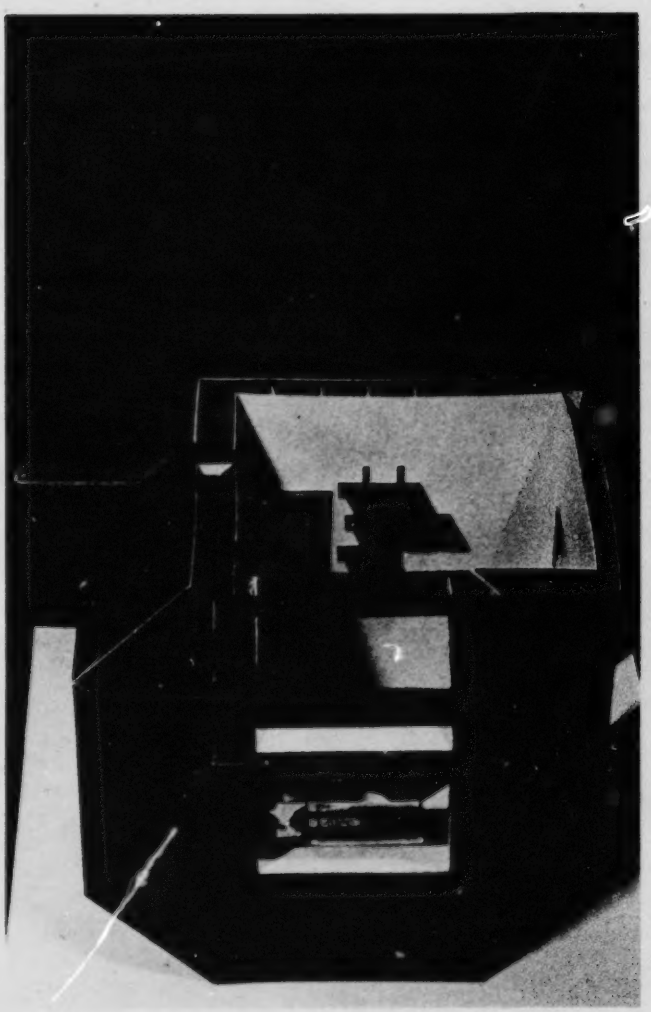
Oscar has had his work displayed at the Felt Forum and Fordham University. He has sold work at art shows and

he has appeared on the front page of *The New York Times*. All this would be very exciting for any youngster of fourteen; but for Oscar Ramirez, who had spent the previous five years in and out of psychiatric hospitals and special schools, it is an inspirational accomplishment. It is also an achievement for his teacher, Sister Carol Valentino, although she denies it.

Oscar remembers his mother making small models of houses in the South Bronx. He remembers checkerboard floors, colored paper walls and hanging chandeliers. Oscar was five when he first remembers seeing these models and at nine he began to draw the same neighborhood and especially the streets of destruction and despair which he knew so well. It was also at this time that he began to exhibit behavioral and emotional problems while attending Public School 130 in the Bronx.

Referred to Mount Sinai, Oscar remained there for three months of psychiatric testing. His memories of the hospital are vague and apparently center around his drawings. "Every morning I would get up, wash my face, change my clothes, have my breakfast, and then sit by the window and watch the trains as they came above ground," he recalls. "I always liked the trains and I would draw them."

Sister Carol explained that Oscar has been diagnosed several times, always in clinical terms that spelled hopeless. Oscar had been almost totally uncommunicative, angry if asked to participate, and generally asocial. His obsessive drawing was one of his only avenues of communication.



When Oscar was released from Mount Sinai he was sent to Bronx Children's Psychiatric Hospital and placed in a therapy group which he did not like. Again, he withdrew into his drawing. "I drew mostly streets. Pelham Parkway. Westchester Square and the Bruckner. I drew the Bruckner over and over and over again." Oscar says *The Bruckner* with a strong, almost facetious, accent on the *Bruck* part, as if that street, more than any other, meant a great deal to him during those years of isolation and sad withdrawal. Sister Carol explains that his drawings were always monochromatic and unpeopled. He virtually fixated on the worst aspects of an already dreary street.

"Then came the big day. I had to leave the place," Oscar continues, referring to the end of his stay at Bronx Children's. "I usually played around in the classroom but on that day I was sitting down, doing what I was supposed to do and not yelling."

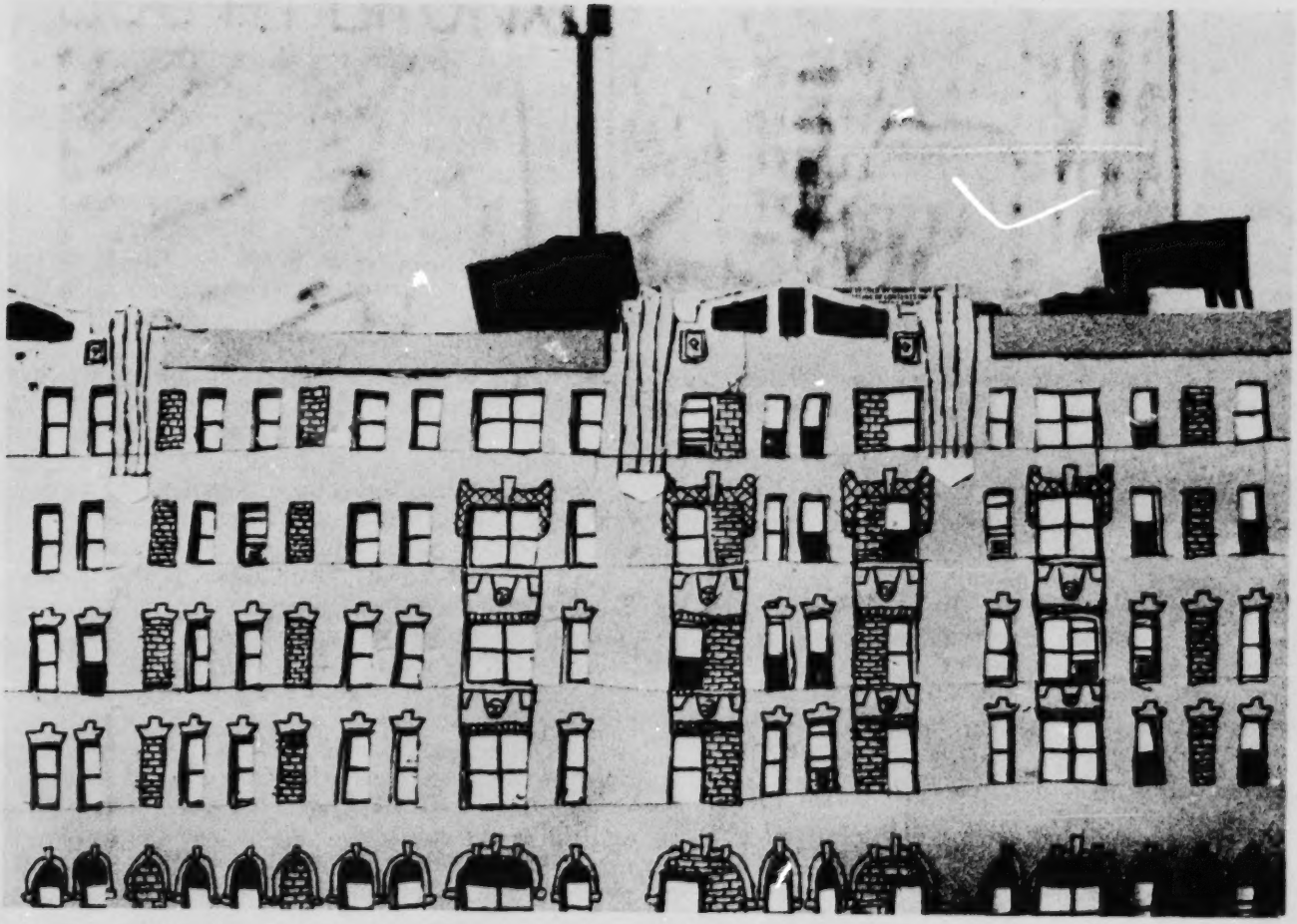
Oscar was sent to P.S. 14's Transitional Class Program which was a great step for him, a reward for superior progress. The Transitional Class Program was housed at that time in pre-fabricated, quonset huts outside the main school. Five teachers worked together, hoping to get the eighteen students mainstreamed into regular high schools.

When Oscar met Sister Carol Valentino on his first day at school, he could not have known that this teacher would help him change his life dramatically.

At P.S. 14, Oscar's day was structured around academics. He had to take math, language arts, and reading and he had to move from classroom to classroom, a new experience for him. He continued to draw and Sister Carol noticed his impressive talent. Thus she encouraged him, rather than discounting the drawing as a symbol of a disturbed and obsessive child. She would drive him around, pointing out landmarks and special streets, suggesting that he draw them. Slowly he built up a collection of drawings of the Manhattan skyline and the Brooklyn Bridge in addition to the streets and highways of the South Bronx. Sister Carol realized that Oscar was able to draw in scale by sight and that he had a phenomenal memory. He would see a corner of a building only once or twice and then be able to reproduce it exactly, complete with signs and architectural detail. Soon he began to add color and eventually people to his drawings.

Sister Carol, a nun in the Dominican Order, teaches in the public school system but does not live in a convent. However, her relationship with the Dominicans is strong and loving, and she wanted Oscar to have a chance to share that with her. The Sparkill Dominican Convent in Rockland County has an annual art show and Carol decided to take Oscar, letting him exhibit some of his drawings of New York City landmarks. At the Sparkhill exhibit Oscar sold ten dollars' worth of drawings, including one of the Bruckner Boulevard.

He went home that night, fresh from his artistic accomplishments at Sparkill, and decided to try and make a three dimensional model of a building that he had drawn so well. He played with materials that he cut, pasted, and taped. His completed model was a little gem, an exact replica of an abandoned building in his neighborhood. Oscar explained his willingness to experiment with model building. "I had been looking at all



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those buildings. Carol had been driving me along all these roads in Manhattan and on the Deegan. I had been looking out the window, seeing all these pretty neat buildings and I thought to myself, why couldn't I make something like that?"

Oscar's first models were similar to his early drawings. He chose only buildings in disrepair. Slowly he began to add color and people, in the same pattern established with his drawings. Then he began to renovate. The dilapidated buildings which marred the complexion of his community would change on Oscar's model. With each new attempt, Sister Carol encouraged and praised his efforts. "Carol told me they were phenomenal. She was giving me lots of flattery," Oscar proudly reported.

Oscar uses cereal and cake boxes for material and proudly adds that members of his class now collect these at home for him. One boy in his class who is especially good with electricity and wiring even suggested that he hook up the lights in one of Oscar's models. "I was respected by everyone at P.S. 14," Oscar said.

Oscar applied to Art and Design on the strength of his portfolio and with Sister Carol's encouragement. He was accepted because it was recognized he had keen powers of observation and a natural ability to draw, in spite of his personal history. Sister Carol is confident that Oscar will do well, although he admitted some fear. "I daydream a lot. Carol thinks I daydream about the corny highways but I dream a lot about her and what I am going to build next. I am going to miss her and I am a little scared; but it's not bad to admit fear." Oscar looks up, finds Sister Carol's eyes and smiles.

It is obvious that Oscar's early images were desperately dismal and alienated. Barren and lonely as his images were, nonetheless, they made up his world, his community. Through his strong and positive relationship with a teacher, who not only recognized the talent but encouraged its growth, his negative world became a positive place for him. Perhaps there is a lesson for all about the positive effects a study of community can afford. Oscar grew out and away from psychological confusions through his neighborhood. Certainly other children, special or not, can benefit equally from such an exploration.

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architects-in-schools

Teachers, artists, and citizens are fascinated by the implications of using architecture as a focus for an interdisciplinary educational program. No one will dispute the theory that our children can become more sensitive to each other and to the world in which they are growing through a study of architecture—or "built environment."[1] Agreement on the value of the concept is almost universal, yet its implementation in the schools is as varied as are the teachers, students, artists and environments in our country.

Unlike the experiences recounted in the other chapters of this book, the A-I-S program is part of a nationwide effort to increase students' awareness of their rights and responsibilities in the matter of the world around them.

> The architecture component of the Artists-in-Schools program of the National Endowment for the Arts places architects in residencies in elementary and secondary schools throughout the country. These architects—broadly defined as "spatial designers"—act as resource persons to involve students, teachers, and interested community members in analyzing their surroundings and participating in the design process. They will help students and teachers develop an awareness of the built environment and its relationship with the natural environment, deepen their understanding of the impact of the built environment on their lives, and encourage their participation in the shaping of their own environment.[2]

During the 78-79 school year three New York City schools became part of the national and statewide network of schools involved in the Architects-in-Schools program. In New York State, the program is administered by the New York Foundation for the Arts with funds partially provided by the National Endowment for the Arts and the New York State Council on the Arts. Educational Futures, Inc. serves as the national coordinator of the program. "The architects in residence seek to teach students and teachers to see

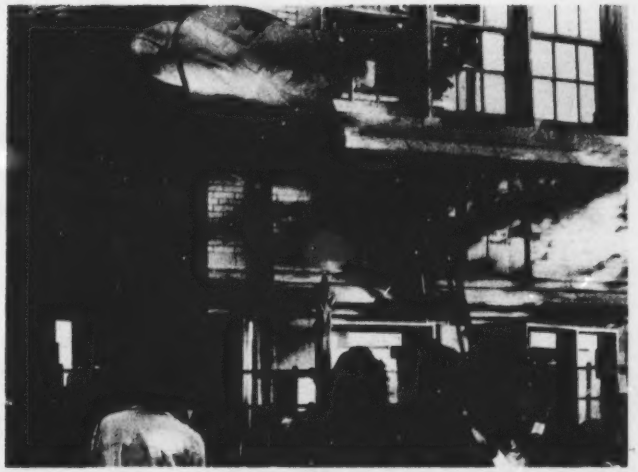
[1] "The built environment is architecture in its broadest interpretation. Comprised of the cities, streets, houses, and parks that man builds and the spaces that connect them, it is the physical framework of our activities and interactions and thus an important determinant of the shape of our lives." A. Eriksen and V. Smith, "Art Education and the Built Environment, *Art Education* 31:5, September, 1979, p. 4.

[2] *Architects-in-Schools Planning Workbook*, Educational Futures, Inc., Philadelphia, Pa., 1977, p. 7.

what they look at, to become conscious of the influence of the environment on them, and to learn effective methods of changing that environment."[3]

Sharon Sutton and Deborah Berke were the New York City architects. Sharon worked with students, staff, and community in Public School 152 in Brooklyn's District 22 and CS 61 in District 12 of the Bronx. Deborah worked with Public School 312 also in District 22. In each school, the aim was to help students discover their ability to affect their built environment. They were made aware of the importance of the design of rooms, houses, schools, yards, and neighborhoods.

[3] *Architects-in-Schools*, 1977-78, Educational Futures, Inc., Philadelphia, Pa., 1979, p. 5.



As a tangible outcome of the Architects-in-Schools program at Public School 152, the parents, students, principal, teachers and community members all pitched in to help Sharon Sutton construct an outdoor kiosk called "Rooms." Usually we think of a kiosk as a small open-sided structure used for some communal purpose—a newsstand, a telephone booth, a subway entrance. (In Turkish, *kiushk* means a pavilion.) In the case of Public School 152, the principal, Dr. Herb Shapiro, defined the purpose of the kiosk exhibit in his own terms: "I would like a structure which will exemplify P.S. 152's role as a useful resource in a changing neighborhood," he said.

The students carried his idea a step further. Weighing all the limitations of budget and schoolyard space, the group decided to erect an attractive figurehead at the center of a series of outdoor display cabinets. In this

way they would share their accomplishments with passersby from the neighborhood.

The students and community gained a great deal more than architectural skills from their kiosk project. Throughout its planning and implementation, Sharon encouraged as much teamwork and cooperation as possible. The teachers welcomed the architect and used professional and artistic experience to make the Architect-in-Schools project truly interdisciplinary. The Parents Association ran fund-raisers; the children wrote logs, sent letters to community members asking for support, and produced a substantial body of written and artistic work for display in the outdoor "rooms." The principal, acting as In-School-Coordinator, planned and motivated a calendar of cultural events culminating in a big fiesta for the dedication of the kiosk.

Out of a rather large group of teachers who wanted to work with the architect-in-residence, three were selected—Ellen Burach, Helen Helman and Ann Rapp, fourth, fifth, and sixth grade teachers respectively. Ellen Burach is an excellent designer with considerable experience doing creative projects with her students. Despite the technical problems of storing materials and found objects, Ellen helped her class produce a number of impressive three-dimensional artistic models. Helen Helman also has considerable experience developing creative student projects. Her credits include the research, design, and building of a pendulum, as well as a geodesic dome. Ann Rapp, although new to P.S. 152, quickly picked up the spirit of the school. Organizing the class's energies, she produced distinguished work with the help of the resident architect.

As In-School-Coordinator for the Architect-in-Schools program Dr. Herb Shapiro's primary responsibility was the scheduling of activities—no small challenge in such a crowded school. Constantly supportive and encouraging, he took upon himself the job of logging every activity with his own camera and skill not to mention taking shovel in hand to dig the holes himself. The eventual unveiling of the Rooms Kiosk at P.S. 152 was an exhilarating experience for the 108 architecture students, three teachers, principal and resident architect as well as other students, parents and community members who had been cheering the work crew onward. As a project, it was tangible, visible proof that teamwork really works.

The following is an excerpt from Sharon Sutton's end-of-year report on the program at P.S. 152:

"Initially, practically everyone including the children thought a kiosk would be vandalized. Why build something that would get wrecked and make the school look worse? Out of this problem, the covert goal of consciousness-raising began to emerge and grow. At that point, our primary goal was to support the children in discovering that they are responsible for making and keeping their school the way they want it to be."

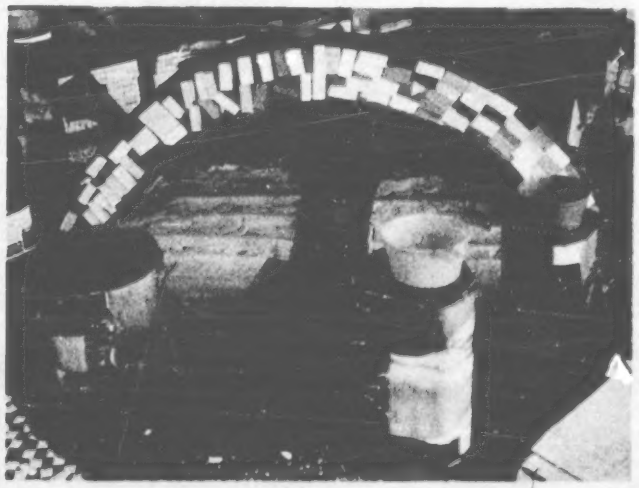
Architect Sutton's other assignment took her to Community School 61 in the troubled South Bronx where the students look out on the devastation that was Charlotte Street. Under the sympathetic initiation of Principal Sherman Tufel and on-going direction of Acting Principal Florence Kaback, this school worked with the architect-in-residence in an entirely different way. At first, Sharon started the children on a project to design and furnish models of ideal apartments for typical families in the neighborhood. Little by little, however, the children began to imagine more and more of the built environment which should surround their apartment models. They talked, wrote and drew their ideas about the ideal neighborhood. Some of the children's parents came to school and contributed their ideas as well. These children knew clearly what they wanted their neighborhood to look like. As third-grader Kim Robinson put it:

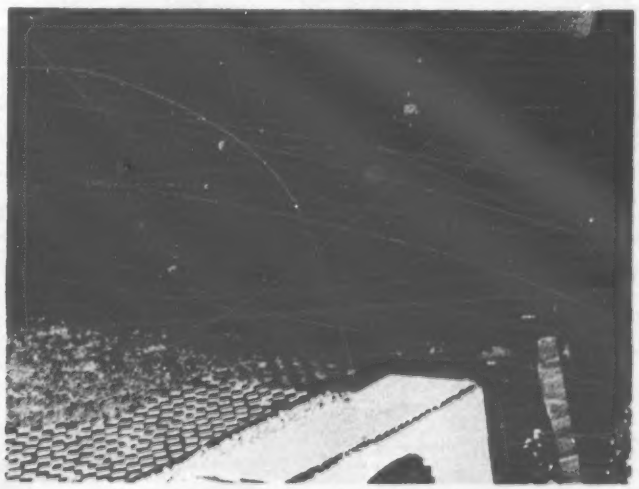
I like my place because it is beautiful.

I like it with my house and castle. It has a white boat in the water. There is a rainbow shining on the beautiful water.

When the children were ready to construct their giant-sized neighborhood model, a base was set up for the model, which was made out of six large pieces of masonite. Cardboard, papier mache, plaster of paris and lots of found objects were used to construct the places that the children and their parents had been describing.

The result is a 12 by 16 foot model which represents their neighborhood as they would like it to be, a place called "The Best Place to Be Me." This in turn became a children's book of writing and photographs documenting their ideas about neighborhood.





Deborah Berke, the other architect-in-residence, worked at P.S. 312 in the Bergen Beach section of Brooklyn where she found students with a rich artistic background. Located in a modern three-story well-equipped building, P.S. 312 is a pleasant elementary school of 800 students. Rose Craw, the In-School Coordinator, is ideally suited for her position because she understands architecture as well as the problems of teaching building principles to young children. Even before the arrival of the architect-in-residence, she had initiated projects to make the children aware of built environment. Virginia Flanagan, the school's principal, and Assistant Principal, Charles Langjahe, were totally supportive of and sympathetic to the Arts-in-General Education concept, and worked well with Deborah. During the school year, the third, fourth, and fifth grade classes working with the architect accomplished a great deal: a bench for the lobby, a puppet stage, models of rooms, an architecture newsletter, planters

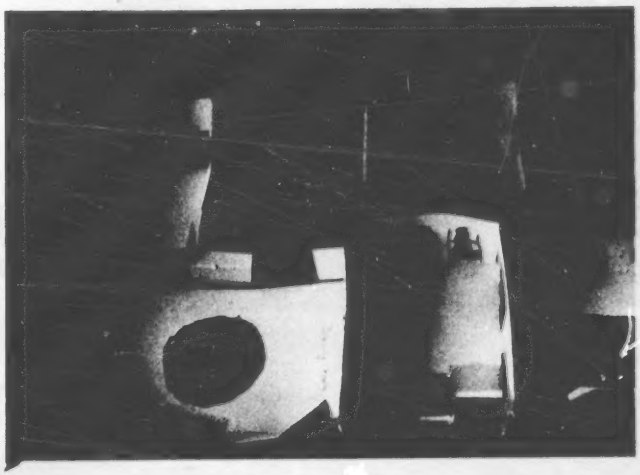
for the courtyard, decorative room dividers. Their most stunning accomplishment, however, was the design of an entire community which could be built on Floyd Bennett Airfield, a deserted Navy base near the school.

Deborah summarized the model city project in these words:

> The project started with a discussion of their own neighborhood. Then the class went outside with the architect to do analyses of the area around the school, how many stores, how many houses? etc. The entire class then went on a visit to the site, where they saw exactly how big it was. Back at school, the class worked in groups of four (around the usual four-student desk configuration) on site maps. In each group there was a person for housing, parks, commerce, and public services. After each group had developed

their ideal layout, the architect met with all the housing people, then all the parks people and so on. Using their pooled expertise, a class master plan was developed. The final map/plan was mounted on a stiff base, and work on the model began. Work on the model was done in the architect's space with small groups of students who came down from the class. This class had studied animated Super 8 film-making while in the third grade and trained the architect in the procedure. The model was constructed as a town would actually develop and the entire process was filmed (single frame animation). Later on the class also did the titles for the film.

This project was immensely successful. Not only were the products (film and model) very beautiful, but the entire process was educational and successfully integrated into the curriculum. In addition the project coordinated the efforts of two artists-in-school, the filmmaker and the architect.



Both the architects-in-residence who worked in New York City during the 78-79 school year found the experience deeply fulfilling, and will continue to work with school children in the year to come. Each architect adapted her own special talents to the unique challenges of the host school. Each found teachers, students, and parents willing to work together toward the ultimate goal of making our "built world" a better one.

Schools interested in becoming involved in the Artists and Architects-in-Schools Program should contact Carolee Pescatore at the New York Foundation for the Arts, 60 East 42nd Street, New York, NY 10017. Additional information can also be obtained from the national coordinator, Aase Eriksen, Educational Futures, Inc., 2118 Spruce Street, Philadelphia, Pa. 19103.

resources

School of Engineering Columbia University 120 St. and Amsterdam Ave. New York, NY 10027 *Contact:* Dr. Mario Salvadori 280-2993	Architectural courses for elementary and secondary teachers
New York City Council on the Environment 51 Chambers Street New York, NY 10013 *Contact:* Michael Zamm 566-0990	Curricula guides in urban studies and referral center for teachers interested in meeting others teaching architecture
Parks Council 80 Central Park West New York, NY 10023 *Contact:* Jeanette Banford 799-6000	Extensive library and curriculum materials on New York City's waterfront
Landmarks Preservation Commission 305 Broadway New York, NY 10013 *Contact:* Information Desk 566-7577	Bulletins listing historical City landmarks
Association of Elementary School Principals 1801 North Moore Street Arlington, VA 22209	Has available *Learning About the Built Environment: A Source Book for Use at the Elementary and Secondary Levels* compiled by Educational Facilities Laboratory. Price: $3
Institute for Architecture and Urban Studies 18 West 40 Street New York, NY 10018 *Contact:* Larry Kutnicki 398-9474	Educational programs for high school students on Saturdays and during summers. Courses include concepts and principles of architecture.
Architects-in-School Program New York Foundation for the Arts 60 East 42nd Street New York, NY 10017 *Contact:* Denise Hamilton 986-3140	Schools can apply to have an architect work in schools for three months with students on special projects. Technical assistance is available.
Arts in General Education Office of Curriculum Development and Support 131 Livingston Street Brooklyn, New York 11201 *Contact:* G. G. Alexander-Green 596-6273	Facilitates the development of schools around the arts by involving staff and community arts resources.
Studio in a School Board of Education, City of New York 131 Livingston Street Brooklyn, NY 11201 *Contact:* Tom Cahill, Executive Director 596-6274	Administered by the Studio in a School Association on behalf of a private donor, this program places professional artists in the schools 5 days a week to work with the teachers and children

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